

The Achilles Heel Of Our National Strategy: Sealift

CSC 1992

SUBJECT AREA Strategic Issues

EXECUTIVE SUMMARY

Title: The Achilles Heel of Our National Strategy: Sealift

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Thesis: The United States has an insufficient surge sealift capability and is rapidly approaching an insufficient sustainment sealift capability.

Background: The ability to project our military forces to any theater of conflict effectively is the only way to assure their credibility and their ability to act as a deterrent. The conflict in Southwest Asia provided us with an opportunity to analyze our strategic lift capabilities against just the type of challenge that strategists see the United States most likely having to face in the future. Only the ready availability of foreign flag shipping, the hesitancy of the Iraqis to initiate hostilities, and the unique characteristics of Saudi Arabia kept our lack of surge sealift capability from seriously limiting the deployment of U.S. forces.

Recommendation: To solve the deficiencies in surge sealift and prevent a further decline in sustainment sealift requires a series of actions that represent a long term balanced approach. These actions would include: expanding our prepositioned shipping while improving the nature and the quality of the cargo embarked aboard it; modernizing the power plant of our Fast Sealift Ships; providing government assistance to revitalize our merchant marine fleet; stripping the National Defense Reserve fleet of its obsolete ships, tailoring its future make-up of ships to be more useful in a crisis; providing a means of rapidly expanding our sealift capability without depleting the manpower pool of skilled mariners; and maintaining the Navy's amphibious assault fleet close to its current level.

The Achilles Heel of Our National Strategy: Sealift

OUTLINE

Thesis Statement. The United States has an insufficient surge sealift capability and is rapidly approaching an insufficient sustainment sealift capability.

- I. The United States' new national military strategy
 - A. Requirement to project military forces to any theater of conflict
 - B. Use of Operation Desert Shield to analyze strategic lift
- II. Airlift and sealift requirements in a crisis

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 1992		2. REPORT TYPE		3. DATES COVERED 00-00-1992 to 00-00-1992	
4. TITLE AND SUBTITLE The Achilles Heel of Our National Strategy: Sealift				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) United States Marine Corps, Command and Staff College, Marine Corps University, 2076 South Street, Marine Corps Combat Dev Command, Quantico, VA, 22134-5068				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 38	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

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 - 2. Summarized performance in SWA
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 - 2. Summarized performance in SWA
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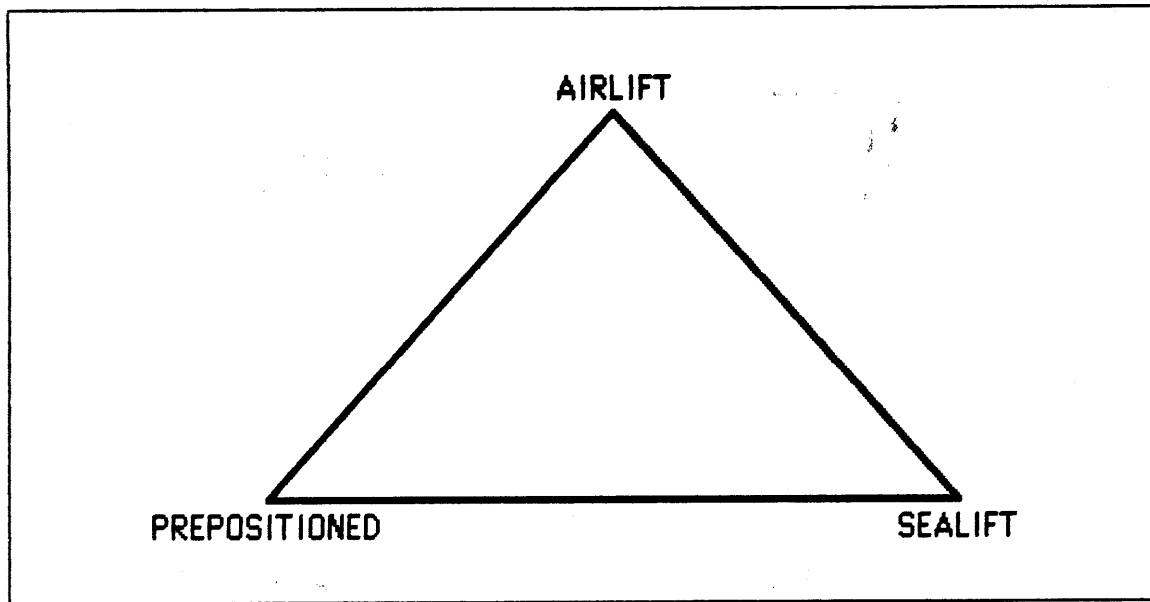
In an era when threats may emerge with little or no warning, our ability to defend our interests will depend on our speed and our agility. And we will need forces that give us a global reach. No amount of political change will alter the geographic fact that we are separated from many of our most important allies and interests by thousands of miles of water.... We'll have to have air and sealift capacities to get our forces where they are needed, when they are needed. A new emphasis on flexibility and versatility must guide our efforts.

President George Bush
The Aspen Institute
2 August 1990

Regardless of the positive consequences of the revolutions in the U.S.S.R. and Eastern Europe, we face the sobering truth that local causes of

instability and oppression will continue to foster conflicts, small and large, virtually across the globe. Our new national military strategy directs attention away from a global war beginning in Europe, and focuses our efforts on regional contingencies. However, unless the United States has a credible force projection capability, regional powers could still be tempted to threaten U.S. vital interests. The gulf conflict has illustrated that these regional crises and conflicts are likely to arise on very short notice, and escalate unpredictably. This will require that we be able to respond if necessary, very rapidly, often very far from home, and against increasingly well armed hostile forces. The ability to project our military forces to any theater of conflict effectively is the only way to assure their credibility and their ability to act as a deterrent.

Operation Desert Storm was the largest military effort since Vietnam. It involved each part of the strategic mobility triad that is depicted in Figure 1. What is more important, for analysis of strategic lift, It was a test of our capabilities against just the type of challenge that strategists see the United States most likely having to face in the future.



STRATEGIC MOBILITY TRIAD

Figure 1

STRATEGIC MOBILITY TRIAD
Figure 1

Our deployment to Saudi Arabia during Operation Desert Shield officially started on 7 August 1990.(1) It began from a "cold start"; without the ninety, sixty, or even. thirty days of warning that military planners project in most contingency plans. Yet, by 31 December, the Military Sealift Command had built a figurative steel bridge across the 8,700 miles of ocean to Saudi Arabia. A total of 179 ships were either en route to Saudi Arabia from the United States, or returning to the United States from Saudi Arabia; an average of one ship per fifty miles. (11:30)

During Operation Desert Shield, as in any major deployment, the strategic sealift mission was divided into two categories, surge shipping and sustainment shipping. Surge shipping is critical to the rapid build up of combat power during the initial stages of a deployment. Ships used in surge shipping must be capable of handling outsized bulky military

vehicles, tanks, helicopters, and unit equipment. These forward deployed forces are then resupplied and maintained by sustainment shipping. The supplies required to meet daily consumption needs and build reserve stocks are conducive to being containerized; moreover, this second category of shipping specializes in transporting containerized cargo.

Despite our sweeping victory in Southwest Asia (SWA), one of the indisputable facts that the conflict identified was a critical problem in our power projection capability. Currently the United States has an insufficient surge sealift capability and is rapidly approaching an insufficient sustainment sealift capability. What effect did this shortfall in surge sealift have on the deployment to SWA? What can we do to correct the deficiencies? What important lessons did we learn in terms of sealift, and how can we apply them in the future? These are just some of the questions that this paper will address.

Airlift and Sealift Requirements

Our initial response to a crisis is most likely to come from forward deployed forces, or airborne forces. Airlift will be used extensively during the early part of the buildup. This method of transport can provide quick delivery of personnel and certain key equipment. However, it has a very limited capacity in its ability to deliver equipment and supplies. One modern containership can carry as much cargo as can be carried in 150 sorties of the giant C-5 Galaxy transport aircraft. Airlift also quickly reaches a point of diminishing returns. A good illustration of this was the U.S. airlift support for Israel during the 1973 Yom Kippur war. Six tons of aviation fuel were required to deliver one ton of cargo to Tel Aviv during this operation. Even the airlift of aviation ordinance into a theater of war is not cost effective; for example, the Air Force's main transport aircraft, the C-141 can only transport enough ordinance for one 8-52 sortie.

Due to these inherent limitations in airlift, U.S defense planners anticipate moving as much as 95 percent of the dry cargo, and 99 percent of the fuel and oil needed to fight a war by sea. In the early days of Operation Desert Shield, aircraft maintained U.S. supply lines almost exclusively; however, when the first two fast sealift ships arrived in Saudi Arabia on 27 August, they carried more tonnage than the entire airlift had up to that point. Table I provides a summary equipment, personnel, and supplies transported to SWA, and it validates the defense planner's' projections.

<u>AIRLIFT</u>		
PAX Transported	500,720	99.5%
Cargo Delivered (S/T)	538,605	5.6%
Missions Completed	15,893	
<u>SEALIFT*</u>		
PAX Transported	2,758	0.5%
Dry Cargo Delivered (S/T)	3,035,387	94.4%
Fuel Delivered (S/T)	6,100,000	
Voyages Completed	459	

Movement Summary to SWA
as of 10 March 1991
Table 1

*The figures do not include Navy or Marine forces afloat.

** (13)

One surprising fact contained in the summary is the tonnage of petroleum, oil, and lubricants (POL) transported to SWA to support Operations Desert Shield and Desert Storm. To the layman it would appear that we were "carrying coal to Newcastle." However, today's military equipment requires extraordinary POL support, and a similar crisis in

another part of the world that does not have the indigenous POL supply of Saudi Arabia would require even more sealift support.

While the airlift segment of our strategic mobility triad performed extremely well in Operation Desert Shield, the sealift segment had to overcome several obstacles to accomplish its mission. By comparing the organizational structure supporting each segment we begin to discover some of the flaws in our sealift planning.

The airlift portion of our nation's deployment plan is based on:

- (1) Active duty military transport aircraft.
- (2) Reserve and National Guard aircraft.
- (3) Civil Reserve Air Fleet aircraft.

All the aircraft in these three categories are used regularly during peacetime for transportation of cargo and passengers, and for training flights. The air crews and ground crews who will operate and maintain these aircraft in wartime are the same ones who operate and maintain them in peacetime. Accustomed to working with their aircraft, they can begin actual deployment and resupply operations almost immediately during a crisis.

In contrast, the sealift portion of our nation's deployment plan is based on:

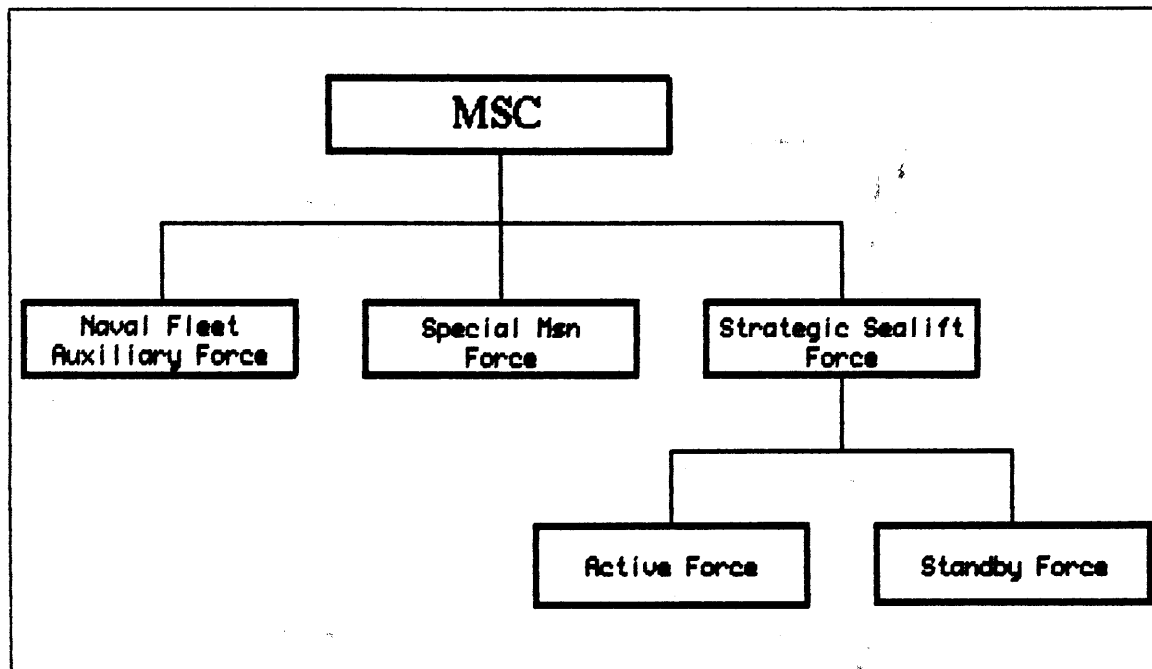
- (1) Active duty military vessels.
- (2) Chartered U.S. merchant marine fleet vessels.
- (3) National Defense Reserve Fleet vessels.
- (4) Military and commercial vessels from Allied nations.

The status of the vessels in these categories during peacetime however, is significantly different from the status of the aircraft discussed earlier, since many of them are not maintained in a fully operational status. What's more, the crews who will be required to operate and maintain these vessels in wartime have not been clearly identified. Consequently, they may lack

familiarity with the vessels' operation. Therefore, to be completely effective, the sealift portion of our nation's deployment plan requires a certain amount of lead time before it can be fully employed. As Operation Desert Shield demonstrated, this lead time is not likely to be available in future crisis.

The Military Sealift Command

The Military Sealift Command (MSC) provides the sealift needed to deploy and sustain U.S. forces overseas. It is organized along functional lines as depicted in Figure 2.



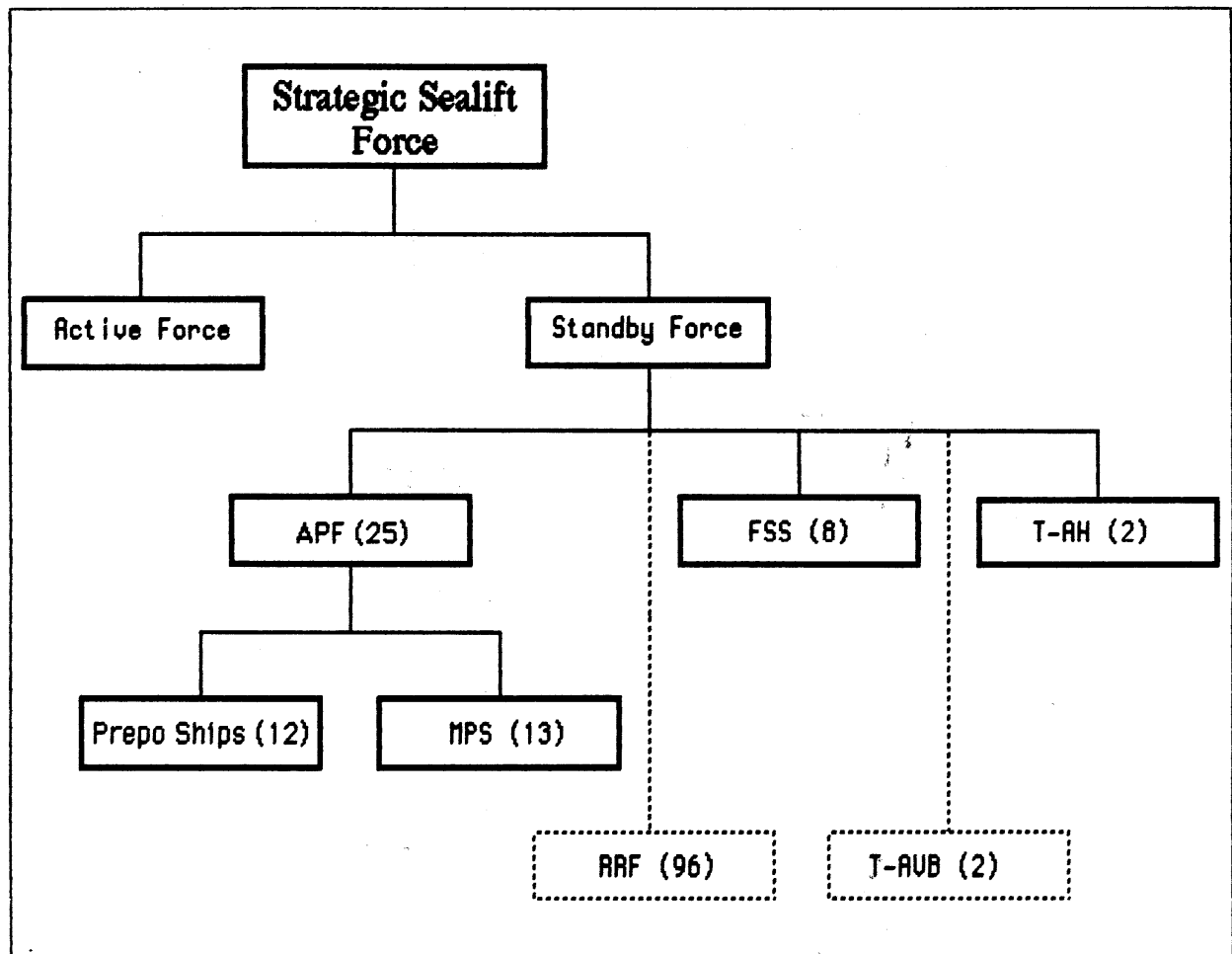
Organization of the Military Sealift Command
Figure 2

The Strategic Sealift Force is composed of an Active Force and a Standby Force. The Active Force consists of handy-size tankers, roll-on/roll-off (RO-RO) ships, and breakbulk ships that the MSC charters from U.S. ship-operating companies. It is sized each year to handle the U.S. military's predicted requirements.(2) The Standby Force consists of ships

that are placed in an on call status. Each ship is assigned a readiness period ranging from immediate to twenty days.

To accomplish its mission the MSC relies heavily on the U.S. flag merchant marine fleet. However, in the 1970s, military leaders began to express concern over the decline in the type of U.S. merchant marine ships that were capable of handling outsized bulky military vehicles, tanks, helicopters, and unit equipment. Commercial fleets were phasing out their breakbulk ships, and replacing them with container ships. Military leaders feared that the United States would not have access to the types of ships required during the surge sealift phase of a deployment.

As a result, in the early 1980s, Congress funded a \$7 billion Sealift Enhancement Program with the intent of bolstering the capabilities of the Strategic Sealift Force. The government purchased or chartered from private owners, ships that were no longer profitable to operate commercially but had military utility. This provided the MSC's Strategic Sealift Force with thirteen maritime prepositioning ships (MPS), twelve prepositioning ships (prepo ships), eight fast sealift ships (FSS), and two hospital ships (T-AH).(3) Additionally, the MSC was provided access to the Department of Transportation's two aviation logistic support ships (T-AVB) and Ready Reserve Fleet (RRF) of ninety-six militarily useful cargo ships (See Figure 3).



Organization of the Strategic Sealift Force*

Figure 3

* The only ships the Navy actually owns are the FSS and T-AH vessels. The Maritime Administration owns the RRF and T-AVB vessels, and the MSC leases the remaining vessels in the Strategic Sealift Force from commercial ship companies

Afloat Prepositioning Force

The quickest response to a surge sealift requirement comes from the twenty-five ships that make up the APF. The first group of ships in the APF are the thirteen MPS vessels. They are U.S. flag merchant ships that have been leased by the Navy from commercial ship companies who have had them specially configured for military cargo.(4) The MSC has organized the MPS vessels into three squadrons. Each squadron is commanded by a Navy

Captain who is embarked with a small staff; but they are crewed by merchant mariners.(5) These squadrons are normally forward-deployed: MPS Squadron One off the Canary Islands in the Atlantic Ocean, MPS Squadron Two off the island of Diego Garcia in the Indian Ocean, and MPS Squadron Three off the islands of Guam and Saipan in the Pacific Ocean. The MPS squadrons each contain the equipment and thirty days worth of supplies for a Marine Expeditionary Brigade (MEB) of approximately 16,500 personnel. To deploy the Marines and marry them up with a MPS Squadron requires 249 C-141 equivalent sorties, but it would take about 4,500 sorties to deploy a force of that size without the MPS Squadron.

One of the spectacular success stories of Operation Desert Shield was the validation of the MPS concept. The four ships of MPS Squadron Two arrived in Saudi Arabia on 15 August, just ten days after call-up. By the first week of September all nine of the activated MPS vessels from MPS Squadrons Two and Three had been off-loaded. During December the MSC activated the four remaining MPS vessels, and shortly thereafter MPS Squadron One was also being off-loaded in Saudi Arabia. An additional benefit realized from the MPS program was the utility of the MPS vessels after they were off-loaded. Eleven of these ships went into a common user pool and transported an average of fifteen additional ship loads of cargo to Saudi Arabia.(6) (13)

The other group of ships in the APF are the twelve prepo ships. For the most part, these vessels contain two broad categories of cargo for Army, Air Force, and Navy units.(7) The first category of cargo consists of common items such as tents, light sets, water trailers, barrier materials, forklifts, trucks, and heavy equipment transports. The second category consists of consumables supplies such as rations, ammunition, and POL. While the cargo on the prepo ships is not tailored to any specific unit, it does assist in establishing such common functions as port support, airfield

support, medical facilities, laundry and bath facilities, mobile kitchens, and maintenance shelters.

Like the MPS vessels, all the prepo ships are leased U.S. flag merchant ships operated by merchant crews. Two of the twelve ships operate independently in the Mediterranean according to MSC schedules. The other ten ships are stationed off Diego Garcia in the Indian Ocean and operate under the operational control of the Commodore of MPS Squadron Two. When these ten were activated they were directed to steam to Saudi Arabia where they were off-loaded by 6 September. The ships were then placed into a common user pool where they provided additional sealift for cargo bound for SWA. Eventually the two remaining prepo ships were also activated and used to provide support for Operation Desert Shield.

The rapid response of the prepo ships highlights the potential benefits of the program and its ability to provide critical support to Army and Air Force units during the initial part of a deployment. Military planners gained valuable experience in this no-notice operation and identified two weaknesses in the prepo ship program. More attention and thought needs to be given to the types and quantities of supplies that are embarked on the ships. In particular, the make up of the ammunition block needs to be revised. Second, the readiness of the equipment embarked on the prepo ships was disappointing and needs to be improved. (24:47) Despite these two shortcomings, the program has significant potential for future use and should be expanded. In fact, as the prepo ships were reconstituted following Operation Desert Storm, the total number grew to thirteen.(8) What's more, the Afmy is actively pursuing efforts to increase the number of ships even more, principally loading them with consumable supplies.

Fast Sealift Ships

The second fastest response to a surge sealift requirement comes from

the eight FSS vessels. Originally they were among the largest and fastest container ships in the U. S. merchant fleet.(9) Acquired by the U.S. Navy during the Sealift Enhancement Program of the 1980s they were reconfigured to serve chiefly as RO/RO ships. The RO/RO design eases the handling of wheeled and tracked vehicles. Together the ships have a combined capacity to transport more than 8,000 military vehicles. (11:30)

The MSC has assigned all eight ships to FSS Squadron One. Like the MPS Squadrons; FSS Squadron One is commanded by a Navy Captain with an embarked staff. Berthed in U.S. ports, a nucleus crew of eighteen merchant mariners maintains each ship in a ninety-six hour reduced operating status. When activated the ships require a crew of forty-two. The additional crew members are merchant mariners employed by private companies under contract to the MSC.(10)

On 7 August, the MSC ordered FSS Squadron One to standup and to transport the 24TH Inf Div (Mech) to Saudi Arabia. Within four days the first ship, the USNS Capella, arrived at its embarkation port. It was loaded and sailed for Saudi Arabia on 14 August. By 22 August all eight ships had been loaded out. The first two ships covered the 8,700 nautical miles at an average speed of twenty-seven knots, and reached their debarkation port on 27 August.

However, the lift was not entirely trouble free. When the Squadron was activated the USNS Antares was undergoing major maintenance on its boilers. The crew hurriedly made the ship ready, but en route to Saudi Arabia it experienced boiler problems and had to be towed to Rota, Spain. The Naval Reserve Cargo Handling Battalion 4 was mobilized and deployed to Rota within seventy-two hours. An hour and a half after their arrival the Reservists were busy transferring the cargo from the USNS Antares to the USNS Altair.(11) The FSS Squadron One completed the sealift of the division's equipment on 13 September, twelve days behind schedule.

FSS Squadron One continued to provide sealift support in support of Operation Desert Shield. By the end of January it had made a total of thirty-two lifts and transported more than 500 million pounds of dry cargo. This equates to the delivery capability of 116 World War II breakbulk ships.

The power plant problems of the USNS Antares illustrate a critical shortcoming facing a significant number of the ships in the Strategic Sealift Force. Relying upon technologies that are unique to these older ships, such as huge steam power plants, imposes severe operating challenges. With the majority of the commercial fleet converting to diesel propulsion plants, experience with the complicated pressurized boiler systems continues to erode. Undoubtedly, future FSS vessels will have a power plant that the ships in the merchant fleet commonly use, but as a critical interim measure a phased reengineering program for the ships in FSS Squadron One should be undertaken.

The U.S. Merchant Marine fleet

As depicted in contingency plans, when the Strategic Sealift Force cannot meet the sealift requirement using vessels from the Active Force, MPS Squadrons, prepo ships, and the FSS Squadron, the Commander of the MSC begins chartering vessels from the U.S. merchant marine fleet. During the first month of Operation Desert Storm, the MSC chartered ten U.S. flag merchant ships. (5:43) The importance of a strong U.S. merchant maritime industry cannot be over emphasized - especially in view of the fact that its ships and personnel are expected to provide 95 percent of the strategic mobility lift required by the U.S. Transportation Command (USTRANSCOM).(12) (13)(20:21) However, the rapidly dwindling U.S. flag fleet represents such a potentially catastrophic dilemma that military planners have been expressing increasing concerns ever since the seventies. The U.S. merchant marine once ruled the seas. In 1967, there were 1,113 active privately-

owned military useful ships, but by 1989 that number had diminished to 267. (19:33) This long-term downward trend of the merchant fleet accelerated during the last three years. Today there are only 164 vessels remaining in the ocean-going U.S. flag fleet and all of these are container ships. (23:A4)

The last two major ship lines with large fleets under the U.S. flag, American President Lines Ltd. and Sea Land Service Inc., are threatening to place most of their ships under a foreign flag in 1995 unless they receive major tax and regulatory concessions from the government.(14) Industry analysts consider these two companies the anchors of the U.S. shipping industry. They essentially invented container shipping which revolutionized the shipping industry. The reflagging of their ships would effectively spell the death of the ocean-going U.S. merchant marine, leaving only intracostal and Great Lakes shipping, which must be American flag under the Jones Act.

There are numerous economic penalties in flying the U.S. flag: more costly tax rules; more stringent Coast Guard rules for U.S. ships than foreign ships that among other things require larger crews; and the higher cost of U.S. crews. The only direct financial advantages to flying the U.S. flag are government subsidies to cover the higher cost of U.S. crews and a requirement that all military cargo move in U.S. ships.(15) The maritime operation subsidies amounted to \$267.6 million in 1991, but the federal government has scheduled these subsidies to end in 1997. Moreover, the overall reduction of the U.S. military's force structure, as well as the decrease in the number of forward based units translates into a significant drop-off in military cargo. The two ship lines claim that these developments will force them into the red unless some relief is given.

If American President Lines Ltd. and Sea Land Service Inc. do reflag their ships it will further exacerbate the existing shortfall of sealift that

is available to the MSC. It would also mean that the MSC would be perilously close to being incapable of meeting its military sustainment requirements. During Operation Desert Storm these two ship lines carried about twenty-five percent of all the military cargo and material shipped to the Persian Gulf. (23:A4)

The Maritime Administration (MarAd) claims that if necessary the United States could commandeer an estimated 138 U.S.-owned but foreign flag ships to compensate for present and future sealift shortfalls. But, a General Accounting Office (GAO) report challenges that view.(16) The GAO believes that the MarAd could only take control of those ships owned by a U.S. citizen, or by a U.S. corporation whose major officers and at least fifty percent of the stockholders were U.S. citizens. Determining ownership during a very short notice crisis would be extremely difficult.

Industry analysts have predicted the consequences of a rapidly shrinking U.S. maritime industry for several years. In 1987, the President's Commission on the Merchant Marine and Defense asserted, "There is today insufficient strategic sealift, both ships and trained personnel, for the United States, using only its resources as required by defense planning assumptions, to execute a major deployment in a contingency operation in a single distant theater such as SWA." (24:46) The effort of the eighties to increase sealift capacity focused on a near-term solution that rapidly expanded government ownership of merchant ships, but failed to reverse the long-term downward trend of the merchant fleet. The ramifications of this policy were readily apparent during Operation Desert Shield and are reflected in the statements of VAdm Paul D. Butcher, Deputy Commander in Chief, USTRANSCOM. In his testimony before the House Merchant Marine and Fisheries Committee he stated, "If we would have had to move faster to combat further aggression by Iraqi we may not have had the sealift to do it. From a national security perspective then, we need to revitalize our U.S.

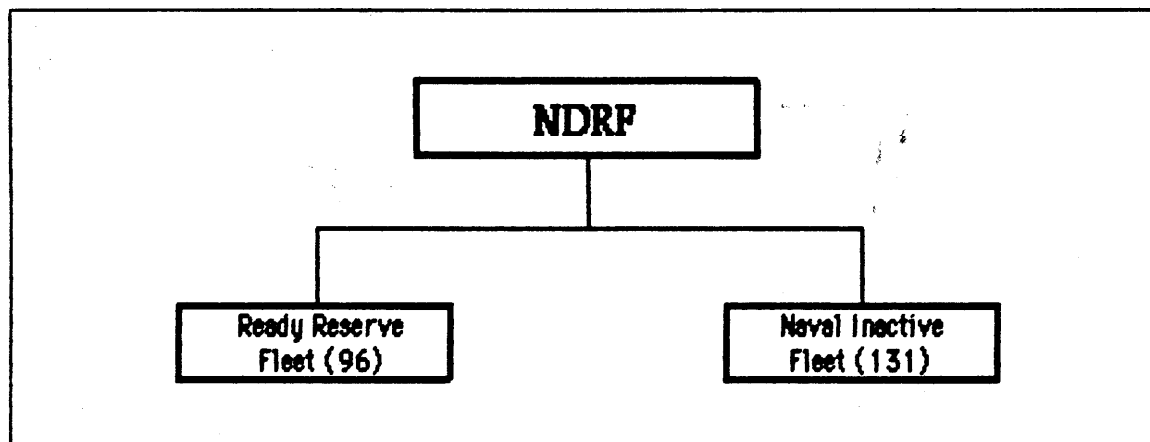
maritime Industry." (24:49)

A partial solution to modernizing and expanding the U.S. flag merchant fleet would be for the government to establish an orderly program of financial support for construction of new U.S. registered vessels suitable for military needs. One such program currently under consideration proposes that the U.S. government build ships that satisfy both commercial and military needs and then lease them to the maritime Industry. After the Congressional appropriation of funds for a shipbuilding and conversion program for fast sealift the Maritime Administration sent several sealift ship designs to U.S.-flag ship operators and asked them for their input. This type of program is reminiscent of the 1950s' Mariner program. Under the 1950s' Mariner program, the Maritime Administration designed and built thirty-five ships with government funds. U.S. operators chartered or purchased these ships and successfully used them for many years.

Any attempted solution to revitalizing the U.S. flag merchant fleet will also have to address the inherent higher cost of U.S. crews. If the Bush Administration follows through on its plan to end the subsidies that were created to cover the higher costs of U.S. crews, then it would only be reasonable to take other steps that would allow American ship lines to compete in a free market economy. One way to accomplish this would be to allow the market place to determine merchant seamen's salaries and compensate the seamen for their loss in revenue by exempting them from income tax.

The National Defense Reserve Fleet

The organization of the National Defense Reserve Fleet (NDRF) consists of two elements; the Ready Reserve Fleets and the Naval Inactive Fleet. (See Figure 4)



Organization of the National Defense Reserve Fleet*

Figure 4

*The Department of Transportation's Maritime Administration maintains the ships in the Ready Reserve fleet. The Navy maintains the ships in the Naval Inactive Fleet.

The RRF is the core element of the NDRF. It was created because the vast majority of the limited number of ships in the U.S. flag merchant marine had specialized in providing transportation for containerized cargo. This type of shipping is ideally suited for use during the sustainment phase of a deployment, but the unit equipment requiring transportation during the surge phase of a deployment is too bulky to be containerized. Therefore, the Sealift Enhancement Program established the RRF to maintain ships that are uneconomical for modern commercial purposes, but critical to military operations.

The RRF's inventory of ninety-six ships includes breakbulk ships, RO/RO ships, modified crane ships capable of operating in unimproved or damaged ports, small tankers, and barge carriers.(18) The MarAd contracts commercial ship managers to maintain these ships in a five, ten, or twenty day readiness status. During a crisis, the Commander of the MSC can request their activation. Upon approval of the request, the ship managers organize crews from the merchant marine to man the RRF ships. Once the ships are

fully stood up, the MarAd turns over operational control to the MSC.

Critics of the RRF argue that the government should focus more attention on revitalizing the maritime industry. They point out that a healthy U.S. merchant marine fleet of sufficient size and military cargo hauling capability could fill in behind the early arriving prepositioned ships and the fast sealift ships. What's more, it would not face the difficulties of reactivation. However, U.S. merchant ships dispersed along the world's trade routes would be malpositioned to carry the initial surge deployment of cargoes. If it is effectively managed, the RRF provides the flexibility and the responsiveness needed to respond to a short notice crisis.

During the first four months of Operation Desert Shield, the Commander of the MSC requested activation of all the RRF's seventeen RO/RO ships and thirteen heavy-lift ships. The activation of these ships still did not meet the surge sealift requirement. In fact, the demand for RO/RO ships was so great that during the first month of the deployment the MSC was forced to charter fifteen foreign flag RO/RO ships. Unfortunately, the current structure of the RRF emphasizes breakbulk freighters and tankers, the two types of ships that were the least required in Operation Desert Shield.(18) During this period, the Commander of the MSC requested activation of only fifteen of the RRF's fifty-two breakbulk ships. Undoubtedly, the ships that were activated were selected because they were considered the most useful.

The RRF's inappropriate ship mix is the first of many problems that need to be addressed. The fifty-two breakbulk ships are the most numerous type of ship in the RRF. They were bought as a hedge against a diminishing U.S. flag dry cargo capacity under the theory that they were "better than nothing." But when the emergency came, these older breakbulk vessels demonstrated that they had less utility than the planners had envisioned. Operation Desert Shield undercut the original argument for their purchase

for the RRF. Devoting more money to their berthing and maintenance is money better spent elsewhere in the program. Furthermore, any future ship additions to the RRF should be of a RO/RO design, the type of ship in greatest demand during Operation Desert Shield.

Another critical shortcoming of the RRF identified during Operation Desert Shield was the overall readiness of the fleet. As part of its responsibilities in administering the RRF program the MarAd is accountable for its maintenance. Like many other government agencies its budget has been reduced by Congress in recent years. For FY90 the MarAd's parent organization, the Department of Transportation (DOT) submitted a budget request of \$239 million for the RRF. Congress slashed the request to \$89 million. Not only did this preclude fleet expansion, but it also contributed to the degradation in maintenance and overall readiness of the fleet.(19) The difficulty in obtaining spare parts for these older ships further complicated the RRF breakout. This is not surprising considering the average age of an RRF ship is twenty-four years.

Former Secretary of Transportation Samuel Skinner points to the reductions in funding for the RRF as indicative of the way the RRF has been "shortchanged by the Congress in the appropriation process for a number of years. As a result, Skinner warned that the readiness status of many RRF ships was not realistic. One major impact of the under-funding according to Skinner, was that the MarAd was unable to conduct test activations and sea-trials of many of the ships in the RRF. More than half of the RRF ships that were activated for Operation Desert Shield had not been tested since becoming a part of the RRF. (8:13)

The actual results of the activation and performance of the ships from the RRF bear out his predictions. During the first four months of Operation Desert Shield, the Commander of the MSC requested that MarAd activate forty-five ships from the RRF, but only forty-two ships were

actually turned over to the MSC. The remaining three were inoperable.(20) Further, of the seventeen RO/RO ships that were initially requested, only three were ready within their five day recall time!

The results for all forty-two ships activated were equally disappointing. Only 11 were ready to sail on time; 13 were one-to-five days late; 10 were six-to-ten days late; and 8 were eleven-to-twenty days late, in all, only fourteen of the forty-two ships reached their loading ports on time. Of the seventy-four RRF vessels that were eventually activated, only twenty-two met their recall times. (3:93) These results clearly indicate that the RRF's readiness must be improved.

The NDRF also includes the Naval Inactive Fleet, which is commonly referred to as the "mothball" fleet. It has expanded from its recent low of 55 ships in 1989, to its current level of 131 ships.(21) With the Navy's active fleet on a steady downward slope from 580 ships in 1989, to 450 ships by 1995, the Naval Inactive Fleet is projected to continue its expansion to more than 200 ships by 1995.(22)

The Navy is responsible for maintaining the ships in the Naval Inactive Fleet at a readiness level that would allow them to be recalled during a national emergency. However, VAdm Paul D. Butcher, Deputy Commander in Chief, USTRANSCOM has observed that the material condition of some of these ships is such that, "We do not believe they can be ready for sea within their thirty to sixty day planned activation window." (24:48) A more realistic figure would be closer to 120 days. (16:45)

Although the Naval Inactive Fleet theoretically represents a pool for attrition replacement and would conceivably support conflicts at higher levels of mobilization, it should be scrutinized for viability. The annual maintenance funding of \$2 million per year is not only a drain on funds, but also provides planners with the illusion of viable assets. (18:22) For several years now former Secretary of Transportation Samuel K. Skinner

has advocated scrapping the vessels in the Naval inactive Fleet and using the funds to purchase additional ships for the RRF.

In view of the Persian Gulf War, the GAO studied this issue during the latter-half of 1991. In its report to Congress the GAO stated that some of these vessels could have been activated if needed for the war. However, it would have taken more time than military planners wanted and the majority of the ships are simply outdated. The GAO went on to suggest that the government could raise about \$42 million by selling the outdated ships for scrap, and at the same time save additional money because the government would no longer have to spend money on their upkeep. On January 28, 1992, the House of Representatives passed and sent to the Senate a bill that would authorize just that.(23) Proceeds from the sale would be earmarked for upgrading the remaining NDRF. If the Senate concurs, then a significant portion of the Naval Inactive Fleet is expected to be sold by 1997.

U.S. Merchant Mariners

In addition to being allowed to use the proceeds from the sale of obsolete vessels from the Naval Inactive Fleet as a source of funding to add more modern ships to the RRF, the DOT requested that Congress provide enough additional funding in FY92 to add five more ships to the RRF. The DOT's goal is to increase the RRF from 96 ships to 142 ships by 1994.(24) However, the RRF is no better than the maritime industrial base available to activate the ships. In particular it is no better than the numbers and skills of the mariners available for crews.

The expansion of the RRF should not exceed the limits imposed by the human and industrial base. The current RRF may have reached that point. The activation of the RRF during Operation Desert Shield created an immediate requirement for 3,000 civilian mariners who understood the

uniqueness of military cargoes. At the request of the MarAd, the U.S. Merchant Marine Academy began a massive campaign to contact over 7,500 graduates. The Academy contacted graduates as far back as the Class of 1955. Additionally, the Academy temporarily released several licensed members of its faculty and staff for Operation Desert Shield duty. By January, over sixty-five midshipmen were serving aboard the many vessels supporting the operations. Even the Commandant of Midshipmen was recalled to active duty.

The RRF met the challenge, but not without considerable difficulties. This rapid activation of about half the ships severely stressed the supply of qualified American mariners and the nations maritime industrial capability. The difficulty in obtaining spare parts for the older ships further complicated the breakout. Likewise, concerns about manning were sharpened because the mostly steam-driven RRF was at odds with the predominantly diesel experience of currently active licensed engineers.(25)

If the entire NDRF were mobilized, it would take many months to train enough crewmen to man all the ships. In fact, it would take many months to train enough crewmen just to man the ships in the RRF. In view of the RRF mobilization during Operation Desert Shield, former Secretary of Transportation Samuel K. Skinner stated that "putting less than half of the emergency fleet in service has nearly exhausted the nation's supply of-merchant mariners."

Any solution to the inadequate U.S. sealift must also address the declining employment opportunities to U.S. merchant seamen. The MSC is already the largest single employer of U.S. merchant mariners. When surge sealift is needed in large quantities and on short notice this relationship does not support an active base of mariners that would provide the additional numbers of seaman needed. What's more, the current mariner work force is aging. The averaged merchant mariner age is fifty-five.(26) By

the end of the decade the majority of the work force will be retired.

There are three possible solutions to overcoming the inadequate number of merchant mariners. The ideal solution would be to revitalize the U.S. merchant marine fleet. This represents a long term solution and would require extensive government involvement. A second solution would be to expand the U.S. Naval Reserve and assign it the mission of manning the RRF. Militarily, this would be a preferable solution, but it would also require an increase in the Defense Department's budget. Therefore, it is probably not a viable political option. The third solution appears to be the most feasible. It would establish a merchant marine reserve program. While this would do little to revitalize the U.S. merchant marine fleet it would provide trained crews that could be mobilized in an emergency.

Foreign Flag Shipping

A 1984 Department of Defense Sealift Study clearly identified that the United States lacked the required sealift necessary to respond to a crisis. To overcome this deficiency, Secretary of Defense Casper Weinberger decided that the United States would seek the commitment of allied shipping in theaters in which U.S. allies could contribute shipping to a common defense. Subsequently, the European members of NATO pledged to augment the U.S. sealift effort that would be required to transport equipment and material to Europe with a pool of 600 commercial ships. Unfortunately, the European merchant fleets are also in a state of decline and currently there are only 496 ships available for the pool. (16:45) What's more, there is no guarantee that any of these ships would be available to the United States in a non-NATO conflict.

As the 1984 DOD Sealift Study predicted, the shortfall of U.S. flagged vessels and American mariners hindered the nation's ability to project military power through sealift during Operation Desert Shield. To make up

for this shortfall the United States was able to obtain additional surge sealift shipping from our allies, friends, and the world shipping market. In the first month of the Operation we chartered thirty-five foreign flag ships. (5:43) By the end of the third month this number had increased to forty-seven. (8:17) During this twelve week period, these foreign flag ships delivered fifteen percent of the dry cargo tonnage. By the end of the twenty-first weeks- the percentage of dry cargo delivered by foreign flag ships rose to twenty-two percent. (21:47) Table II provides a comparative listing of the type and number of ships used in Operations Desert Shield and Desert Storm as of 10 March 1991.

TYPE	U.S. FLAG		FOREIGN FLAG	TOTAL
	MSC	MERCHANT MARINE		
FSS	8	0	0	8
RO/RO	20	11	19	50
Breakbulk	32	10	45	87
Barge Carrier	12	1	0	13
T-ACS	1	0	0	1
Total Dry Cargo Ships	73 (46%)	22 (14%)	64 (40%)	161
Tankers	3 (8%)	23 (64%)	10 (28%)	36
Total Ships	76 (39%)	45 (23%)	74 (38%)	195

Sealift Summary
as of 10 March 1991

Table II*

* (13)

As Table II plainly illustrates, only the ready availability of foreign flag shipping kept our lack of surge sealift capability from seriously limiting the deployment of U.S. forces. Directives from the National

Command Authority led the Commander in Chief, Central Command to require that all forces be in theater by 15 January. The Deputy Commander in Chief, USTRANSCOM, VAdm Paul D. Butcher characterized the foreign ships as "essential" to meeting this deadline.

The total number of foreign flag ships that were eventually chartered to support the deployment and retrograde is even more dramatic and vividly highlights the issue of the lack of U.S. flag sealift. Of the 197 commercial dry cargo ships chartered, 168 were foreign flag. (3:93) Besides underscoring the Inadequacy of existing U.S. flag assets, the large number of chartered foreign flag ships raises the issue of risk in incorporating such ships into future planning. In this conflict, the coalition against Iraq was broad and therefore there was an adequate amount of foreign flag shipping available. However, against some other threat to U.S. vital interests it could be narrow enough to preclude the general availability of foreign flag ships for U.S. charter.

Furthermore, in developing contingency plans that rely on some amount of foreign flag sealift, it would be prudent to remember that the Allies lost 5,150 ships in World War II. Today, even some of the Third World nations have fielded highly sophisticated submarines that are far superior to the Nazi U-Boats of World War II. It seems reasonable to expect at least some merchant ship attrition in future conflicts. This leads to the question, how much effect would such a threat have on the availability of foreign flag commercial shipping?

In analyzing the foreign flag shipping used in Operation Desert Shield, particular attention should be paid to what was not volunteered or made available for charter. Particularly noteworthy was the early absence of any Japanese or German flag ships. The question of Japanese and German contributions to the sealift effort was raised on several occasions, but shipping assistance materialized very slowly. This slow response provides

a particularly telling comment on foreign assistance when one considers that the Japanese have 426 RO/RO ships and 439 general cargo ships. Even more significant is the fact that both Japan and Germany depend more on oil exported from the Gulf than does the United States.

While such circumstances might have led us to expect ships to be made readily available, the actual results only serve to remind us that these ships are not subject to U.S. government control and may not be available when needed the most. This tends to reinforce the validity of a cautious "go it alone" assumption concerning foreign participation in U.S. led military operations. Therefore, we must be prepared to respond to threats to our national security in geographic areas not covered by alliance commitments or at times when allied shipping is not available.

Future Sealift

Operation Desert Shield highlighted the fragile state of our current sealift system. Yet, despite the United States' inadequate surge sealift capability, USTRANSCOM carried out the surge phase of the Gulf deployment without major problems. In fact, the United States deployed more forces, faster and farther than ever before. But, the United States had four major advantages:

(1) Allied and friendly nations offered ships to the United States for charter.

(2) The Iraqis did not initiate hostilities during the buildup phase.

(3) The undamaged ports of Saudi Arabia are among the most modern in the world.

(4) Saudi Arabia provided substantial amounts of fresh water and petroleum products to the coalition forces.

These four advantages combined to create a situation that tolerated weaknesses in U.S. sealift readiness, which under different conditions

could have caused failure.

Before any comprehensive changes can be made to our sealift system, policy makers must first determine the future force structure and force employment concepts. Operation Desert Shield clearly demonstrated the need to match lift assets with force requirements. The hand-in-glove relationship between sealift and contingency force deployment requires that the sealift system of the next decade needs to be tailored with greater understanding and with a better fit in mind. A review of the U.S. Army's and U.S. Marine Corps' deployable force posture would be a logical starting point.

The Army's base force of the future will provide a CONUS power projection capability of one corps consisting of five divisions and a corps support command (COSCOM).(27) The Army's position on the strategic mobility of this corps is that the lead brigade must be on the ground by C+4, the lead division by C+12, two heavy divisions sealifted from CONUS by C+30, and the remaining two divisions and the COSCOM by C+75. To accomplish the sealift portion of the Corps' deployment requires that ships be available at ports to load initial units by C+2 on the East Coast and C+4 on the Gulf Coast. The two heavy divisions would have to clear their CONUS ports by C+10.(28) The forces would deploy with seven days of supplies, and prepositioned ships would provide an additional thirty days of supplies. Continued sustainment of the Corps would require that MSC establish the sea lines of communication by C+30. (1)

The Marine Corps' deployable force posture is greatly influenced by the availability of amphibious sealift. The Navy's amphibious assault fleet provides the core element of the active duty portion of the strategic sealift equation. More important than just adding to the total sealift capacity, the amphibious assault fleet with its embarked Marines also ensures access to areas lacking adequate port or off-loading facilities, or

areas requiring forcible entry. The Reagan era goal of a 600 ship Navy would have provided the Marines with enough lift for a MEF and a MEB. However, reductions in the defense budget and "block obsolescence" of amphibious ships threatens to demolish the Marines' ability to prepare for their amphibious mission. Currently, the Navy operates sixty-three amphibious ships, including two LSTs (Landing Ship, Tank) in the NDRF. However, fifty-two of these ships are scheduled to be retired between 1995 - 2008.(29)

The Marine Corps' position is that it requires enough amphibious shipping to transport the assault echelons (AE) of two MEFs; one in the Atlantic, and one in the Pacific. An AE would consist of the units that would lead an amphibious assault. Roughly equivalent to a MEB, it would contain approximately 20,000 Marines, with fifteen days of supplies. The balance of the MEF, between 30,000 and 40,000 Marines, comprises the assault follow-on echelon (AFOE). (31:61) This AFOE would then require transportation in "black - bottom" (non-Navy) ships. This places an increased emphasis on the need for a responsive surge sealift capability. During a recent interview, the Commandant of the Marine Corps, Gen. Carl E. Mundy, Jr. stated that, "A fast sealift capability clearly would benefit all users of sealift, including Marines, in a major amphibious operation, or to sustain the forces ashore." (31:64)

This is not to say that we can or should neglect our amphibious assault shipping. We must maintain a reasonable balance between assault shipping and the other types of surge sealift. Otherwise we will be in the situation that LtGen Bernard E. Trainor, USMC (Ret), was warning against when he observed:

The ability to make a forcible entry cannot be overemphasized and is perhaps the most important point to be made. A nation may have the most formidable of forces with the most exquisite means of strategic mobility, but if

the combination of the two cannot ensure successful entry except by invitation, the nation has only a reinforcement capability. (10:57)

To provide enough sealift for the AE of two MEFs, three major amphibious shipbuilding programs are under way and a feasibility study for a fourth is being conducted.(30) The Defense Department's Base Force Plan reflects the net effect between retirement and new construction. The number of ships in the Navy's amphibious assault fleet will shrink to fifty, where it is to remain steady. (17:4)

In the past, the number of ships necessary to meet the wartime requirement, plus a percentage of ships that would be in the maintenance cycle determined the size of the amphibious assault fleet. For example, to meet the wartime requirement to provide enough sealift for the AE of two MEFs, two MEBs worth of amphibious ships are required. A national MEB requires nineteen amphibious ships to lift it; therefore, thirty-eight ships are necessary. After factoring in maintenance requirements, a total of 2.5 MEBs worth of amphibious ships is needed. This is very close to the Navy's plan for fifty amphibious ships.

Today however, we must also consider the requirement of maintaining a forward presence. Again, the events of Desert Shield serve to illustrate this point. As was pointed out earlier, a national MEB requires nineteen amphibious ships to lift it. But only thirteen amphibious ships were available to embark 4th MEB for its deployment to the Persian Gulf. This prevented the embarkation of all AE's cargo aboard amphibious shipping. The MEB eventually loaded the overflow aboard two MPS ships. This provided a field expedient solution to the lack of amphibious shipping, but it had a significant operational impact because it limited the number of potential landing sites available to the landing force.

The lack of available amphibious shipping was the result of a conscientious decision to maintain a forward presence in other areas of the

world. The 22nd MEU and 26th MEU were deployed to the Mediterranean; a training deployment, the West African Training Cruise (WATC) was conducted off the coast of Africa; and a training deployment, the United States Integrated Training of American States (UNITAS) was conducted off the coast of South America. Responses to future crisis will face similar constraints. The planned reduction in amphibious shipping will leave military planners with even less flexibility and far short of its true requirements.

The obstacles that had to be overcome in deploying to the Persian Gulf serve to illustrate that we must ensure that the true lessons of Operation Desert Shield are not swept away by the, euphoria over the stunning success of Operation Desert Storm. The key lesson we should take away from the conflict in SWA is that our nation must be prepared, with little warning, to project significant U.S. forces great distances. To solve the deficiencies in surge sealift that were highlighted during Operation Desert Shield requires a series of actions that represent a balanced approach. These actions would include: expanding our prepo ship program while improving the nature and quality of the cargo embarked aboard it; modernizing the power plant of our FSS vessels; providing government assistance to revitalize our merchant marine fleet; stripping the NDRF of its obsolete ships, tailoring its future make-up of ships to be more useful in a crisis; improving the maintenance of all ships in an on call status; providing a means of rapidly expanding our sealift capability without depleting the manpower pool of skilled mariners; and maintaining the Navy's amphibious assault fleet close to its current level.

Above all else this balanced approach must represent a long term commitment that needs be followed through to the end. We have made several attempts in the past to correct some of these deficiencies; only to see such efforts diverted at the last minute. For example, Congress

appropriated \$15 million for fast sealift research and development in the 1990 Budget. The money was later transferred to fund the Panama Economic Aid Bill. Under a separate proposal Congress also appropriated \$600 million for a sealift shipbuilding program. The Graham-Rudman-Hollings Deficit Reduction Act came into play and led to an \$8 million reduction in the program. In its FY91 defense budget plan, the Administration proposed shifting the remaining \$592 million to fund M-1 tanks. The Administration eventually transferred about half these funds to military personnel accounts and withheld the rest under the Impoundment Control Act. Since these actions did not have an easily identifiable effect on our deployment to Saudi Arabia the consequences of similar actions could be easily misunderstood. If they are misunderstood, our triumph during Operation Desert Shield of deploying such a large force, in record time will have become a facade that put too pleasant a face on reality.

List of Abbreviations

AE	assault echelon
AFOE	assault follow-on echelon
APF	Afloat Prepositioning Force
CONUS	continental United States
COSCOM	Corps Support Command
DOT	Department of Transportation
FSS	fast sealift ship
FY	fiscal year
GAO	General Accounting Office
LKA	amphibious cargo ship
LPD-2	amphibious transport dock
LPD-4	amphibious cargo ship
LPH	landing platform helicopter
LSD	landing ship, dock
LST	landing ship, Tank
MAC	Military Airlift Command
MarAd	Maritime Administration
MEB	Marine Expeditionary Brigade
MEF	Marine Expeditionary Force
MEU	Marine Expeditionary Unit
MEU (SOC)	Marine Expeditionary Unit (Special Operations Capable)
MPS	Maritime prepositioning ship
MSC	Military Sealift Command
MTMC	Military Traffic Management Command

NDRF	National Defense Reserve Fleet
OPDS	offshore petroleum distribution ship
PAX	passenger
POG	Port Operations Group
POL	petroleum, oil, and lubricants
Prepo Ship	prepositioning ship
RO-RO	roll-on/roll-off
RRF	Ready Reserve Fleet
S/T	short ton
SWA	Southwest Asia
T-ACS	auxiliary crane ship
T-AH	hospital ship
T-AVB	logistic support ship
UNITAS	United States Integrated Training of American States
USTRANSCOM	United States Transportation Command
WATC	West African Training Cruise

Endnotes

1. This was five days after President Bush's prophetic speech to the Aspen Institute cited at the beginning of this paper.
2. For the 1990 Active Force, the MSC contracted from commercial ship companies the services of eleven U.S. flag dry cargo ships and twenty-six U. S. flag tankers. (24.47)
3. The MPS vessels and the prepo ships make up the MSC's Afloat Prepositioning Force (APT)
4. The commercial ship companies currently involved in the MPS program are the Maersk Line, the America Overseas Marine Corporation, and the Waterman Steam Ship Corporation.
5. The Navy Captain's official naval title is Commandore, MPS Squadron 1/2/3.
6. The other two MPS ships were tasked to support the amphibious landing force (CTF 158) in the Persian Gulf, (CFT 158 consisted of 4th MEB, 5th MEB and 13th MEU (SOC)
7. These twelve ships consist of: 4 dry cargo ships containing cargo for Army units, 1 float on/float off ship containing cargo for the Army's POG; 3 dry cargo ships containing cargo for Air Force units; 1 dry cargo ship containing a naval fleet hospital; and 3 tankers.
8. These thirteen ships consist of : 3 dry cargo ships containing cargo for Army units, 1 float on/float off ship containing cargo for the Army's POG; 4 dry cargo ships containing cargo for Air Force units; 1 dry cargo ship containing a naval fleet hospital; 4 tankers (2 consol and 2 OPDS tankers loaded with JP-5 fuel, which can be used in both aircraft and vehicles).
9. These ships are almost as large as an aircraft carrier and can cruise at speeds of more than thirty knots.

10. The commercial ship companies currently involved in the FSS program are the International Marine Carriers, Inc. and the Bay Tankers, Inc.
11. The USNS Altair is another FSS vessel that was returning to the U.S. after unloading its cargo in Saudi Arabia.
12. The U.S. Transportation Command has three component commands; the Military Airlift Command (MAC), the Military Sealift Command (MSC), and the Military Traffic Management Command (MTMC).
13. Even though the ships in the Strategic Sealift Force are a combination of government owned and leased or chartered commercial ships, they are all crewed by merchant mariners.
14. The two ship lines desire faster depreciation schedules, permission to lower crew salaries, and the exemption of crew salaries from income tax. Most foreign countries exempt merchant mariners from income tax. They also request that U.S. authorities adopt international ship design standards. The U.S. accepts these standards for foreign ships calling at U.S. ports, but require more stringent rules for U.S. ships.
15. The government can waive this requirement during a military crisis. For example, operations Desert Shield/Storm required the use of foreign flagged shipping to transport military cargo.
16. The GAO findings were rendered in an April 1988 report to Senator Ernest F. Hollings (D-S.C.)
17. These ninety-six ships can be separated into three broad categories: eighty-three dry cargo freighters, eleven tankers, and two Landing Ship, Tank (LST).
18. For Desert Shield, high grade fuels were readily available, reducing the need for a large number of tankers.
19. To maintain the ships in the RRF in a five, ten, or twenty day recall status requires about \$225 million per year for maintenance. (20:22) The DOT's FY92 budget allocates \$234 million for the RRF. (3:99)
20. By the end of operations in SWA, the Commander of the MSC had requested the activation of a total of seventy-eight RRF vessels, but only seventy-four were turned over to the MSC.
21. It is important to note that 115 of these ships are World War II - era vessels. (18:22)
22. In his March 3 & 4, 1992 testimony before the Senate Defense Appropriations Subcommittee and the House Armed Services Committee, Navy Secretary H. Lawrence Garrett III said, "Three ships are being decommissioned every two weeks." (27:6) Some of the retiring ships will be sold or leased to foreign navies, some will become museums, and more than a few will be sold for scrap.
23. HR 3512, The National Defense Surplus Fleet Disposal Act
24. The DOT's expansion plan forecasts an RRF composed of 104 dry cargo ships, 36 tanker ships, & 2 LSTs.

25. Eighty-three percent of the RRF ships have steam propulsion plants, sixteen percent have diesel, and one percent have gas turbine.
26. The oldest merchant mariner involved in the sealift of equipment and supplies during Operation Desert Shield was eighty-two years old. (13)
27. The five divisions are: the 82nd INF DIV (ABN), the 101st INF DIV (AASLT), the 24th INV DIV (M), the 1st CAV DIV (AR), and the 7th INF DIV(L)
28. The National Security Council estimates that to deploy a mechanized division would require transportation for more than 100,000 tons of cargo. To sustain that division overseas would require the daily delivery of approximately 1,000 tons of supplies and ammunition. (25..46)
29. Among the ships the Navy is scheduled to retire during this period are: 7 LPHs (landing platform helicopter), 6 LSDs (landing ship, dock). 2 LPD-2s (amphibious transport dock), 11 LPD-4s (amphibious card ship), and 5 LKA (amphibious cargo ship).
30. The three major amphibious shipbuilding programs currently under way are: the L5D-4 (Whidbey Island-class) dock landing ship, the LSD-41 cargo variant dock landing ship, and the LHD- I (Wasp-class) multimission amphibious assault ship. The feasibility study is focusing on a new amphibious ship designated LX. It is now being designed and will be configured to replace the LPD, LSD, LKA, and LST classes. The Navy's current five-year shipbuilding plan calls ordering one LX ship in 1995 and one in 1997. (28:28)

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